CEE News
CIVIL and ENVIRONMENTAL ENGINEERING Department

UNC CHARLOTTE
The WILLIAM STATES LEE COLLEGE of ENGINEERING

Fall 2016

cee.uncc.edu

LETTER FROM CEE Department Chair

Welcome to this installment of the CEE newsletter!

I am pleased to report that 2016 is finishing with a fresh round of accolades in teaching, research and service, with significant achievements by our faculty, students, alumni and friends. Earlier this fall semester, Professor Janos Gergely was formerly recognized as one of five finalists (of over 1000 faculty on campus) for the prestigious Bank of America Award for Teaching Excellence. Construction sites are often his classroom and federal agencies frequently solicit his expertise in concrete and large-scale structural testing.

One of our recent graduates, Charles Rose, recently published a book entitled "Journey to Success: Defy the Odds and Realize Your Dreams". Indeed it's a reminder for all of us to be mindful of what we are doing with our lives. Similarly, we're exceedingly proud of Gregory Brigman, and his valiant participation in the U.S. Paralympic Soccer team – another example of CEE Alumni being well-rounded and having extraordinary character.

Our research continues to grow, with a massive new award from the U.S. Department of Transportation to Professor Wei Fan. His team will receive $7.8 million over five years for his center entitled: Center for Advanced Multimodal Mobility Solutions and Education (CAMMSE). CEE Faculty involved in the center include Professors Marty Kane, Miguel Pando, and David Weggel, as well as Yu Wang from Computer Science.

Make no mistake, our department has grown rapidly because of investments by the State of North Carolina as well as myriad public and private partnerships throughout the Charlotte metropolitan region. This, in turn, has catalyzed national and international opportunities for students and faculty engaged in the full spectrum of research and teaching activities. A vital ingredient to this success formula is the engagement and support from alumni and friends. To that end, we're connecting alumni and friends to the department's advisory board, faculty, staff and students. Many thanks to those who have responded to our survey to identify their choice of volunteer category (e.g., social media, alumni relations, fundraising, community engagement and accreditation/assessment). We're still building "teams" so let me know if you would like to help in any of those areas, or merely wish to receive status updates. The intent is to coordinate our efforts to raise the visibility of CEE at UNC Charlotte and to increase the resources available for programming and scholarships.

Our latest scholarship from Carl Ellington, P.E. '80 with Talbert, Bright & Ellington, Inc. is a wonderful example of giving back. TBE's full-ride, four-year scholarship will have a transformative effect on an especially deserving CEE student. Of course giving in any amount has the potential to be cumulatively transformative. This potential was evident by comparing our strong performance in the William States Lee College of Engineering for the #NinerNationGives 36 hour social media fundraising effort. We had participation from faculty, staff, alumni, friends and even current students!

On that note, let me remind everyone with one more opportunity: Consider volunteering (or at least cheering on the students) at the next Carolinas Conference, to be hosted by our department March 30-April 1, 2017. That would be great time to come back to campus, reconnect and recommit!

John L. Daniels
Professor and CEE Department Chair

AT A GLANCE: CEE @ UNC Charlotte

Undergraduate Students: 436
MS Students: 40
PhD Students: 39
Faculty Members: 25

Alumni Spotlights: pg. 9

in this issue

UNC CHARLOTTE SCMA BlockFest

The Southeast Concrete Masonry Association (SCMA) hosted civil engineering and civil engineering technology students from the UNC Charlotte for "BlockFest" at the Adams concrete facility in Charlotte on November 4, 2016. The students toured the concrete masonry manufacturing plant and tried their hand at laying cinderblock with guidance from Doc and Grayson McGee of McGee Brothers Company from Monroe, North Carolina.

Adams, a division of Oldcastle Company, is a recognized leader in concrete masonry technology and design. SCMA is a trade organization formed to promote the quality use of masonry materials and technical data as well as the economic advantages and many uses of concrete masonry units, designs and codes for residential and commercial concrete construction. ◆

ASCE STUDENT CHAPTER: 2017 Carolinas Conference Update

Submitted by Sierra Mondin

The UNC Charlotte American Society of Civil Engineers (ASCE) Student Chapter will be hosting the 2017 ASCE Carolinas Conference from March 31st through April 1st, 2017. This annual event will bring together over 400 civil and environmental engineering students from the southeast region.

Competing schools in the region this year will include UNC Charlotte, North Carolina A&T University, Duke University, North Carolina State University, Clemson University, University of South Carolina, The Citadel, Horry-Georgetown Technical College, University of Georgia, and Georgia Tech. In addition, Carolinas Conference usually hosts international universities to compete with us and this year will include Vellore Institute of Technology (VIT) University from India, Punjab Engineering College (PEC) University of Technology from India, and Zagazig University from Egypt.

ASCE
UNC Charlotte Student Chapter

Carolinas Conference Website:
http://asceconference.uncc.edu/

UNC Charlotte is responsible for hosting the national competitions, The Concrete Canoe and The Steel Bridge, as well as creating other civil engineering related competitions. This year, UNC Charlotte will host competitions in the following subjects: environmental, Freshmore, geotechnical, hydraulics, the mead paper, quiz bowl, concrete baseball bat, surveying, T-shirt, and transportation.

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CEE FOOTBALL Tailgate

The Department held its fourth annual 49er Football Reception on November 12, 2016 on the third floor of EPIC. An estimated 100 people attended the lively function, including faculty, staff, alumni, students, and guests. Attendees enjoyed delicious food and drinks,

Dean Bob Johnson (left)

and even a raffle. Members of the ASCE student chapter provided an informative tour for the tailgaters. A rousing performance by the Pride of Niner Nation Marching Band and color guard rounded out the fun event. After the reception, many of the tailgaters attended the football game in Jerry Richardson Stadium across the street from EPIC building. Unfortunately, the 49ers bowed to the Rice Owls in a 21-22 loss. ◆

CEE GRAD Student News

Amirhossein Adaryani, an Infrastructure and Environmental Systems (INES) Ph.D. student received the 2016 Environmental Research and Education Foundation (EREF) Scholarship award. The EREF is a leading institution funding scientific research and educational initiatives for waste management practices, benefiting industry participants and the communities they serve.

Amirhossein's research will investigate the ability of prevalent wood-decay fungi (e.g. white-rot fungi) to decompose landfill leachate's contaminants like persistent pharmaceutical compounds and plastic additives which harm aquatic life and environment in general.

Amirhossein started his Ph.D. in the INES program at UNC Charlotte in spring 2016 working with Dr. Olya Keen, combining his interests in solid waste industry and wastewater treatment. ◆

SOURCE: https://erefdn.org/amirhossein-rezaei-adaryani/

ALUMNI Spotlights


CEE Alumnus, Charles Rose Jr.

Photo Credit: Wade Bruton

UNC Charlotte civil engineering alum **Charles Rose Jr., '12** started his journey to success as a high school student in the Bahamas. In September he wrote a book about it. The short autobiographical book, entitled *Journey to Success: Defy the Odds and Realize Your Dreams*, was self-published in August 2016, two years after Charles' graduation from UNC Charlotte.

While at UNC Charlotte, Charles was active in the student chapter of the American Society of Civil Engineers (ASCE) and his local church. Once called 'Mr. Shy Guy,' Charles was seldom without a smile and a kind word. His mother, who sometimes worked five jobs to support Charles and his older sister, is his biggest inspiration. Charles is quick to also credit mentors in the CEE Department for his success. He sees his story as a catalyst to help others achieve their dreams. In 2014, Charles accepted the invitation to take the podium and tell his life-changing success story as part of the College of Engineering commencement exercise.

After years of keeping a journal of his pursuits, he self-published *Journey to Success*. Engineering continues to be his passion but he is also passionate about inspiring the next generation to discover and pursue their hearts' desire. He's come a long way from that small dot of an island in the middle of the Atlantic. Charles landed a job as a civil engineer with Blythe Construction, a nationally recognized Charlotte-based civil construction company, before he even graduated. We expect great things from this CEE alum who dared to dream big, walk in purpose, be thankful, and pay it forward.

Civil Engineering graduate **Greg Brigman, '09** is an Olympian. "This has been life changing for me," Brigman said, speaking of his experiences as a member of the United States Paralympic Soccer Team. "It's been a fantastic adventure."

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A History Moment

UNC Charlotte's first football team was called the Owls. Their season lasted for 2 years, 1946-1948. The UNC Charlotte 49er season started in 2013, playing in the new Jerry Richardson Stadium.

If you have a bit of CEE historical trivia to share, please send it to us at cee.dept@uncc.edu.

LinkedIn Anyone?

Are you on LinkedIn.com? Once upon a time, social networking was only for teenagers, taking duck-faced selfies in bathroom mirrors. Thank goodness, there are now social networks for professionals. If you are a current CEE student or alumnus, join our CEE Alumni networking group on Linkedin. And post an update just like the graduates listed below did.

Frank DiPaolo, E.I.

B.S.C.E., Spring 2015
Recently relocated to St. Petersburg Florida. Working as a Transmission Engineer for High Power Development in Tampa Florida.

Bryson Stevens, E.I.

B.S.C.E., Spring 2015
Currently working as a Land Development Designer for McAdams in Durham, NC

Cameron Day, E.I.

B.S.C.E., December 2014
Currently a Geotechnical Senior Staff Engineer with Geosyntec Consultants, Atlanta; and pursuing MS in Geotech/Geoenv Engr from NC State online

Nicole Ng, E.I.

B.S.C.E., December 2014; Recently graduated with a MS in Environmental Resources Engineering from SUNY-ESF. Relocating to Cheyenne, WY to work as an Environmental Engineer with the Air Force

Benjamin Bowers, Ph.D.

BSCE May 2009, MSCE August 2010;
Ph.D. UT Knoxville; Working for the Virginia Transportation Research Council in Charlottesville

ALUMNI: Share *Your* News

Please send us news of your latest accomplishments, awards, or recognition.
Email your announcement to the department at cee.dept@uncc.edu.
Be sure to include your: Name, mailing address (if updated), company name, degree, major and class.

We're also on Twitter ... @UNCC_CEE

ASCE STUDENTS: 2017 Conference

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The Concrete Canoe competition will take place Friday March 31st at Ramsey Creek Park on Lake Norman in Huntersville, NC. The Steel Bridge Competition will take place on Saturday April 1st at the Hauser Alumni Pavilion at UNC Charlotte. All the other events will occur throughout those two days at Ramsey Creek Park and inside EPIC classrooms.

There will also be a Civil Engineering Career Expo, where Charlotte area engineering firms will be given a table to network with over 400 civil engineering students from across the region and world. The conference will conclude with a banquet and awards ceremony at UNC Charlotte's Popp Martin Student Union.

Our guest speaker will be Dr. Patricia D. Galloway, a former President of ASCE and President and CEO of Pegasus Global Holdings, Inc., a 100% woman-owned international management consulting firm.

If you would like to reserve a table at the Career Expo or to become a conference sponsor, contact Christina Saunders at csi5535@gmail.com or Darin Basso at dbasso@uncc.edu. ◆

Dr. Patricia Galloway,
President/CEO of Pegasus Global Holdings, Inc.,
www.pegasus-global.com

SPOTLIGHTED Journal Papers (See Google Scholar for more)

Dr. Mei Sun

Sun, M., Arevalo, E., Strynar, M., Lindstrom, A., Richardson, M., Kearns, B., Smith, C., Pickett, A., and Knappe, D.R.U. "Legacy and emerging perfluoroalkyl substances are important drinking water contaminants in the Cape Fear River Watershed of North Carolina." Environmental Science & Technology Letters, DOI: 10.1021/acs.estlett.6b00398. [http://pubs.acs.org/doi/abs/10.1021/acs.estlett.6b00398]

Dr. Wei Fan

Fan, W., Gong, L., Washing, M, Yu, M. and Haile, E., Key Factors Contributing to Crash Severity at Highway-Rail Grade Crossings, Journal of Modern Transportation, July 2016.

Dr. Matthew Whelan

Whelan, M.J., Ralston, A.D., and Weggel, D.C. (2016) "Blast Testing of Cold-Formed Steel Stud Wall Panels," Journal of Performance of Constructed Facilities, 30(2), 04015008.

CONFERENCE Proceedings

Ramsey, J., Cavalline, T., Whelan, M.J., Goyal, R., and Tempest, B. (2016) "A 25-year retrospective on bridge-related crashes in North Carolina: frequencies, user costs, and associated bridge characteristics," Transportation Research Board (TRB) Annual Meeting.

Goyal, R., Whelan, M.J., and Cavalline, T. (2016) "Multivariate Regression Modeling of Bridge Deterioration: Identifying Factors Influencing Deterioration over the Life-Cycle," 8th International Conference on Bridge Maintenance, Safety, and Management, Foz do Iguanu, Brazil, June 26-30.

CEE VISITING Faculty

Dr. Dan Jin, Associate Professor, is from the Institute of Energy Economics and Management, School of Management, China University of Mining and Technology. Her expertise is in the areas of green mining economics and environmental and ecology associated mining activities.

Dr. Qiang Sun, Associate Professor, is from the School of Resources and Geosciences, China University of Mining and Technology. His expertise is in geomechanics associated with mineral and rocks and the multi-physical correlations of rock constitutive properties.

Dr. Jian Yu, Associate Professor, is from the College of Territorial Resources and Tourism, Anhui Normal University, China. His expertise is in environmental impacts due to heavy metal pollution and environmental assessment of soil. ◆

INTERNATIONAL Collaborations

Th e CEE Department hosted a cohort of international students from Brazil. Th ey were part of the Brazil Scientifi c Mobility Program, a student exchange initiative which provides scholarships to Brazilian undergraduate students in STEM fi elds. Several of them were in the States for two semesters. Th ere were 16 Brazilian students from the exchange program at UNC during Fall 2015 and Spring 2016. Six of them were in Civil Engineering, six were in Architecture, and four were in other Engineering majors. Th e civil engineering students were Juliana Marques, Kébia Bruno, Daniel Crispim, Frederico Brion, Vitor Russyere, and Ronaldo Rodrigues.

Mr. Carlos Rodriguez, a M.S. student working with Dr. Pando at UNC Charlotte will be defending his M.S.C.E. thesis at the Javeriana University in Bogotá, Colombia. His work is part of the Environmental Research and Education Foundation (EREF) project.

Mr. Guillermo Zavala, a visiting professor from Pontifical Catholic University of Peru (PUCP) in Lima, Peru, continues his work in the Department with Dr. Miguel Pando. He is investigating liquefaction of sands using the advanced cyclic simple shear testing device as part of his doctoral studies.

A DIVERSE Profession

Fifty years ago when the William States Lee College of Engineering was founded, there were no women in engineering at UNC Charlotte. The first woman admitted into the engineering program was Dona Thorn Haynes. She graduated in 1969 with a BSE in Mechanical Engineering.

More than four decades later, the UNC Charlotte student body is more than 47% female but our College of Engineering is only about 12% women. Of the five departments within the Lee College of Engineering, the Civil and Environmental (CEE) Department has the highest number of female students at 16.5%, just a bit higher than the national average according to a National Science Foundation statistic. Continue reading to discover stories about three different women in engineering in our department. One is an engineering teaching faculty member and the others are still students; all are experiencing the diversity inherent in the field of engineering.

Dr. Erika Weber is one of the CEE Department's structural engineering faculty. She's been teaching since she joined the department in 2014. Her original interests in structural engineering started in a college Statics class. The Seattle, Washington native says she knew she would be an engineer in high school.

Of the five departments within the Lee College of Engineering, the Civil and Environmental (CEE) Department has the highest number of female students...

Dr. Weber's inner drive helped her reach her educational goals. After finishing an Associate's Degree in Civil Engineering at Ricks College, she went on to earn a BS and MS in Civil Engineering at Brigham Young University and started her first job as a structural engineer in 2004 with a Las Vegas based consulting firm.

Dr. Erika Webber (left) with Bristol Weekly, early-entry MS student

By 2009, drastic downturns in the housing market meant many engineering firms were releasing engineers in large numbers. After being released from three engineering firm in less than five years, Erika enrolled in the University of Utah as a doctoral student. "Things seemed to go better after that," she says but admits that self-doubt had crept in along the way. Fortunately, she was a registered professional engineer in California and Nevada prior to the market crash. Through it all Dr. Weber maintained focus on her dream to work as an engineer. "It's okay to dream," she shared. "Achieving dreams isn't easy but its worth [the pursuit]."

CEE doctoral student **Jenet Hattaway** had her sights set on environmental issues from an early age. In high school she worked with Nobel Peace Prize winner Sandra Brown, known for her work in the impacts of land use on climate change. Jenet, a native of Milton, Florida, had many interests but chose to follow her penchant for the environment into civil engineering. After two years at the University of Florida she married and moved to Houston, Texas where she eventually earned a BS in Civil Engineering from the University of Houston.

By 1985, Jenet and her husband had relocated to Charlotte. She worked as a stormwater engineer for the City of Charlotte until the birth of her son. Later, a daughter was born. Jenet took time off from full-time employment and worked part-time while raising her children. When her daughter went off to college, Jenet wanted to return to the workforce but found that some of her computer skills were outdated.

Attending classes at Central Piedmont Community College and UNC Charlotte part-time helped her fill the gaps and opened up networking opportunities. She networked her way into a job with a local engineering firm. When that position ended during the recession, she started taking classes at UNC Charlotte toward her Master's degree full time.

After earning her MS in 2014, Jenet progressed into UNC Charlotte's Infrastructure and Environmental Systems (INES) Doctoral Program. The prospect of finding solutions to known problems appeals to her. She's on track to graduate in 2018 with her doctorate. She admits to having had struggles with motivating herself, particularly while earning her MS and professional engineering registration. Having a small committed support group has helped her. But she has also found returning to academics later in life have a freeing effect. Her advice to others who struggle with motivation: keep moving forward.

CEE Senior **Bristol Weekly** has developed a similar muscle-through attitude since she started the BS program at UNC Charlotte in 2012. Bristol grew up in Charlotte and comes from a long line of engineers who are

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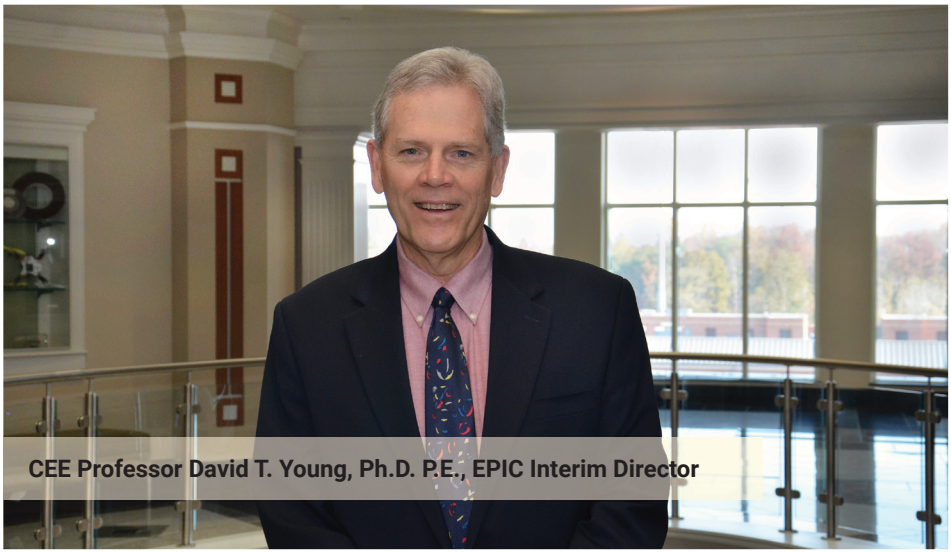
A FLEXIBLE Career



CEE Professor David T. Young, Ph.D. P.E., EPIC Interim Director

The profession of engineering is said to be one of the most flexible of career paths, with its graduates being sought out by STEM and non-STEM employers. One perfect example of the flexibility of the profession is that of **Dr. David T. Young**.

Dr. Young is a tenured professor in the Civil and Environmental Engineering (CEE) Department. He currently teaches courses in structural analysis and design, forensic engineering, and power plant design. During his 43 year career, Dr. Young has worked 31 years at UNC Charlotte and 12 years in private practice. He has conducted academic research, published hundreds of journal articles, presented at engineering conferences, led technical seminars, and served in many academic administrative roles, including CEE department chair for 18 years.

Now, that's a diverse career. But David Young is not done yet. On October 1, he stepped into the role of interim director of the Energy Production and Infrastructure Center (EPIC). He served as the associate director of EPIC for several years before former director Johan Enslin accepted a position with Clemson University. The registered professional engineer from South Carolina still takes on a few clients through his private consulting firm. And he continues to teach structural engineering classes in the CEE Department. "[Teaching is] the most exhilarating part of my day," he shared. Dr. Young came to UNC Charlotte in 1985 shortly after earning his doctorate in Civil Engineering from Virginia Tech. He enjoys seeing students mature through the discipline but fears that many engineering students fail to see past the intense math and science focus to the flexibility of an engineering career.

> **"You will do well, if you pursue what you're passionate about."**

Research and experience have proven that role models and mentors make the difference. Dr. Young's 5th grade teacher Ms. Copeland was his first STEM role model. Ms. Copeland planted the seed for map making that led him to a love of mechanical drafting. He later found motivation from his 7th grade science teacher who reinforced his love for technical things. "You will do well if you pursue what you're passionate about," Young said, recounting Mr. Fox's mantra.

As a professional, he knew the value of mentors. He sought out senior engineers to take him under their wings in each position he took. He feels that all engineers need mentors regardless of gender, but in a profession with more males than females he senses a relunctance of women engineers to seek out male mentors.

As interim director of EPIC, Dr. Young will continue to lead the energy infrastructure research cluster and direct the EPIC high-bay laboratory. He frequently represents EPIC at conferences and meetings, serving on panels and giving presentations on education and energy.

The Energy Production and Infrastructure Center (EPIC) serves as a state-of-the-art research center that provides education and applied research opportunities to students with energy related interests. Its industry-education partnerships unite students, faculty and industrial partners to collaborate on interdisciplinary research and learning.

EPIC and the Lee College of Engineering have paired together to create programs, courses and energy concentrations within multiple departments that surpass technical skills and engineering. Its facilities assist the energy industry in training the next generation of engineers who deliver new and creative solutions for the energy industry. ◆

Source: UNC Charlotte newsfeeds
Photo credit: Mike Hermann

Prepare Yourself for the Profession with an M.S.C.E —

Acquire a year of experience toward the PE with a Masters. For most states, including North Carolina, the MS degree reduces the required time to obtain a PE license by one year. By taking two Masters-level courses as an Early-Entry student, you could reduce your remaining credit hours toward the Master's degree to just 24, which can be completed in as little as one year beyond the Bachelor's degree. To find out if you qualify, email sspulugurtha@uncc.edu or call 704-687-1739.

HURRICANE MATTHEW Disaster Relief

l-to-r: Chris Bathgate of SKA, Paul Sprouse of NC DOT, Cameron Bryant of Black & Veatch, Janos Gergely of UNC Charlotte

After causing major damage and destruction in Haiti on October 4, Hurricane Matthew made landfall just south of the NC border near McClellanville, South Carolina on October 8.

The slow-moving Category 1 hurricane had 75 mph winds and produced major rainfall. As Matthew churned its way out of North Carolina five days later, record rainfall amounts had been recorded across coastal North Carolina. River flooding and power outages were seen as far inland as the capital, Raleigh—more than 120 miles inland.

According to the National Weather Service, many area rivers reached record highs after 16 inches of rain in places. The Cape Fear River, south of Fayetteville, NC, had crested at 26 feet above flood stage on Monday October 10. In the days afterward, rivers continued to rise. The Neuse River, further north near Goldsboro, crested at 29.5 feet above flood stage—a foot higher than the previous record set by Hurricane Floyd in 1999.

In the wake of the storm, teams of engineers associated with the three Design Professional Organizations (DPO) in North Carolina were dispatched to the affected area. The DPO consists of the American Association of Civil Engineers (ASCE), Structural Engineers Association of North Carolina (SEA) and the AIA North Carolina. These engineers offer architectural and engineering disaster assistance on a volunteer basis.

During Hurricane Matthew relief efforts, three teams of two design professionals were based out of Edgecombe County, North Carolina. CEE **Professor Janos Gergely** was among them. They assessed flood damage to residential structures. Their goal was to allow home owners to either return to their homes or gather belongings before making other living arrangements. One team was called upon to assess the stability of dams on the Tar River. Two of the two-man teams are pictured to the left.

"Although we had prior [Federal Emergency Management Agency] training," Dr. Gergely shared, "nothing prepares you for the extent of the actual flood damage we witnessed. On the other hand, it was a great opportunity for us as design professionals to assist the public in such an emergency." Dr. Gergely is the faculty advisor for the student chapter of the American Society of Civil Engineers (ASCE) at UNC Charlotte. This was his first hurricane disaster relief deployment. He is currently being trained to become an Urban Search and Rescue Structures Specialist.

It's estimated that the teams inspected more than 400 homes in the four-day period. Work will continue as waters recede in the flooded areas—namely, Robeson, Lenior, and Pitt Counties. There is a need for more DPO engineer/volunteers. To find out more about volunteer registration and training, contact Persia Payne-Hurley at 919-825-2285 or phurley@ncem.org. ◆

CEE FACULTY Spotlight

Janos Gergely, associate professor of civil and environmental engineering, was one of the finalists for the prestigious Bank of America Award for Teaching Excellence, one of UNC Charlotte's highest accolades.

Gergely, along with the other award finalists Anita Blanchard, associate professor of psychology and organization science; Matthew Davies, professor of mechanical engineering and engineering science; Jae Emerling, associate professor of art and art history; and Daniel Jones, associate professor of chemistry; were finalists for the honor. Dr. Davies was named the 2016 recipient on September 9.

John Daniels, professor and chair of the CEE Department, stated, "High expectation in a demanding major is not a recipe for fabulous student evaluations, yet Janos consistently has the highest scores in the department."

Committed to experiential learning, Gergely spends considerable time every semester gathering contemporary real-life examples of civil engineering, organizing field trips to construction sites, and emphasizing the practical nature of the engineering profession. For example, in his sophomore-level civil engineering course, he makes frequent use of the many ongoing construction activities near campus as teaching sites. The new light rail extension project has been salient to students who respond well to this approach to teaching.

"Dr. Gergely explains content in a way that makes it intriguing and amusing. His passion has enlightened me and made me want to strive to reach new goals and standards for myself," said senior civil engineering major Ahmad Alshamali.

For his commitment to teaching excellence, Gergely received the inaugural Chi Epsilon (UNC Charlotte's civil engineering honor society) Civil Engineering Professor of the Year Award in May 2008 and the William States Lee College of Engineering Graduate Teaching Award in 2005.

Dr. Gergely is the faculty advisor for the student chapter of ASCE and regularly volunteers on Habitat for Humanity work days. ◆

Source: Lee College of Engineering newsfeed

ALUMNI Spotlights

(Continued from Page 3)

Paralympian Greg Brigman, CEE Alum

Photo Credit: teamusa.org

The Forty Niner alumnus holds three degrees from UNC Charlotte. He earned his bachelor's in Civil Engineering in 2009, his bachelor's in math in 2010 and his master's in Civil Engineering in 2013. His wife, Louremy Pena, is also a Niner, having earned her Bachelor of Science in Construction Management in 2011 and Master of Science in Construction and Facilities Management in 2012.

At the age of 29, Brigman made a connection at a soccer referring clinic to the U.S. Paralympic team. "The guy running the clinic knew the coach of the U.S. team and convinced me that I should contact him about trying out," Brigman said. "I didn't know if I qualified as a Paralympian. The conditions for soccer are cerebral palsy, stroke and traumatic brain injury, so I knew I had a chance. But I also hadn't kicked a ball in five years, so I wasn't sure I could make the team even if I did qualify medically."

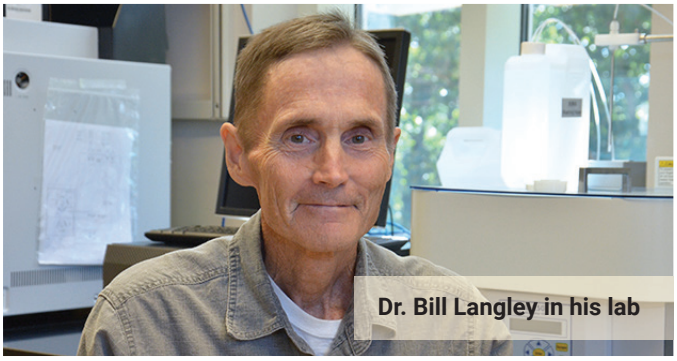
The U.S. Paralympic Soccer Team left for the Games in Rio de Janeiro, Brazil on August 30. They were ranked eighth in the tournament. Their first match was against the Netherlands on September 8th. They claimed points on a late goal to clinch a 2-2 draw against The Netherlands. Unfortunately the team was eliminated on September 12th with their 3-2 loss to Argentina. The US Team is currently ranked 6th in the world out of 53 nations.

Greg has worked as a structural engineer for Darden Engineering Services in Mooresville, North Carolina for more than a year. He and his wife are both UNC Charlotte alumni. ◆

Source: Lee College of Engineering and CEE Department newsfeeds; teamusa.org

RESEARCH FACULTY Spotlight

Dr. William "Bill" Langley came to the Department in 2014 as a Research Associate Professor. After a brief return to private industry, Bill is back in CEE. He is teaching groundwater resources classes and, in the Spring, will teach the hydrology and hydraulics undergraduate course. The Charlotte, NC native brings extensive expertise in water quality modeling and coal ash management. A multi-published engineer, Bill has patented a bioremediation method. He holds a B.S.C.E from UNC Charlotte, a M.S. in civil engineering from the University of South Carolina, and Ph.D. in civil engineering from NC State. ◆



Dr. Bill Langley in his lab

Photo Credit: Mike Hermann

RESEARCH Factoid

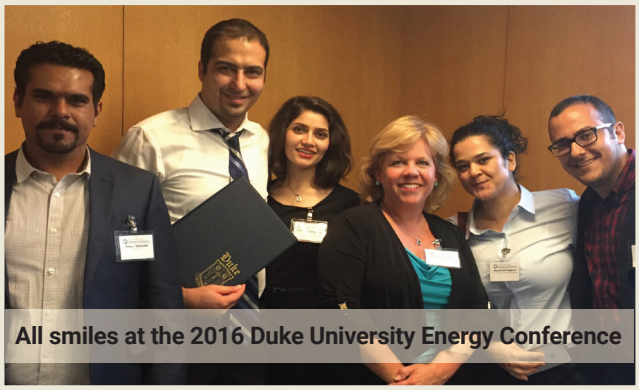
CEE Department & Coal Ash Research

The CEE Department has more faculty with coal ash expertise than any other department in U.S. These researchers include Drs. John Daniels, Miguel Pando, Milind Khire, Vincent Ogunro, Rajaram Janardhanam, Shen-En Chen, Brett Tempest, Dr. Youngjin Park and Dr. Janos Gergely.

Pictured above: CEE Chair, Dr. John Daniels with Ph.D. student Jenet Hattaway
Source: CEE Department History, http://engr.uncc.edu/coe50/history/departments
Photo Credit: Mike Hermann

UNC Charlotte Grad Students Dominate Energy Conference Poster Contest

Five UNC Charlotte graduate students took top awards for research posters at the Duke University Energy Conference on November 2. The Conference, a student-led event, brings together thought leaders in industry, government and academia each year. The event was part of the Energy Week at Duke University.


All smiles at the 2016 Duke University Energy Conference

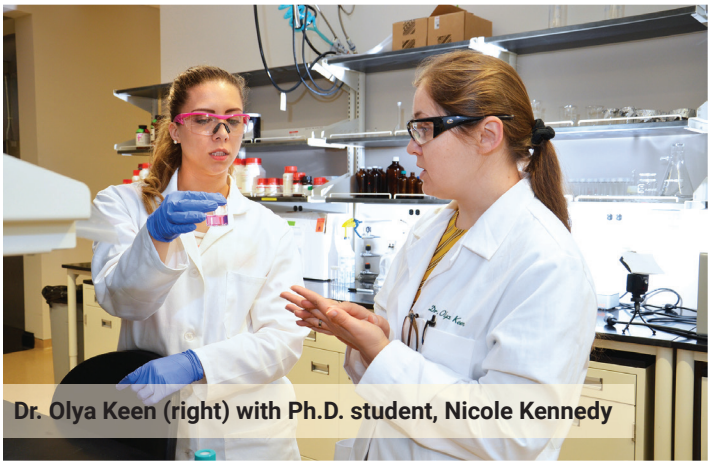
The students are all Ph.D. candidates in the College of Engineering. All of their research is relates to the energy industry. Pictured here (left to right) are Alireza Bafandeh*, Soheil Razmyar*, Zahra Razzaghpanah*, Hilary Davidson, Banafsheh Saghaei**, and Alireza Javanshir*.

The first-place prize based on the participants' votes was given to Alireza Javanshir's research poster. Second place based on the judges' votes was given to Soheil Razmyar's research poster. Third place based on the judges' votes was given to Samuel Dunbar* (not in the picture).

CEE student, **Banafsheh Saghaei**, presented her research about leachate from coal ash ponds in the Southeast. She is using UNSAT-H, a FORTRAN computer model, to simulate water balance in unlined coal ash ponds and landfills. Banafsheh is a graduate research assistant with Dr. Milind Khire. ◆

Hilary Davidson is Director of Sustainability and Community Affairs for Duke Energy and a CEE Department Advisory Board member;
**Mechanical Engineering students;*
***Civil & Environmental Engineering student*

CEE RESEARCHERS: Preventing Superbugs


Dr. Olya Keen (right) with Ph.D. student, Nicole Kennedy

According to an Associated Press 2008 investigation, at least 46 million people in 24 major American cities have minute concentrations of pharmaceuticals in the drinking water supply. Sources include hospitals and nursing homes, but also private residences.

Chlorine is used as a disinfectant in wastewater treatment. It destroys microorganisms like Giardia as wells as germs that cause water-borne diseases like typhoid fever, cholera, and Hepatitis A which can increase in frequency during floods. Our dependence on chlorine disinfection is widespread. Almost 98% of wastewater treatment systems in the U.S. use some type of chlorine disinfection to keep the drinking water supply free from disease.

Unfortunately, the presence of antibiotics in wastewater in the United States is also high. Resistance and allergies to penicillin, a common antibiotic used to treat bacterial infections, has led to the wide use of alternatives like amoxicillin and doxycycline. Conventional wastewater treatment methods do not remove all antibiotics. Released into the waterways, antibiotics can lead to antimicrobial resistance and mutations in aquatic life.

CEE assistant professor Olya Keen has been doing cutting-edge research on the interaction between chlorine and doxycycline in wastewater since she arrived at UNC Charlotte in 2014. "Treated wastewater," said Dr. Keen, "is one of the major sources of pharmaceuticals and antibiotics in the environment." Her research has shown that chlorine is creating unknown antibiotics which are stronger than doxycycline.

Bacteria in the environment can develop immunities to antibiotics and become more dangerous "superbugs". The U.S. Centers for Disease Control and Prevention (CDC) reports that at least 2 million people become infected with bacteria that are resistant to antibiotics and 23,000 people in the United States die each year as a direct result of these infections (2016).

Dr. Keen's work has gained national attention in a short amount of time. She was a guest speaker at the 2015 Annual American Chemistry Society meeting, where her work was highlighted. Keen, who is the Chair of the Organic Contaminants Research Committee for the American Water Works Association (AWWA), plans to study how chlorine interacts with other antibiotics. Concurrently, she is working on a proposal to research effective ways to educate rural communities and large hospitals about environmentally-friendly disposal methods for all types of pharmaceuticals. ◆

SOURCES: *http://hosted.ap.org/specials/interactives/pharmawater_site/index.html*
https://chlorine.americanchemistry.com/Chlorine/DrinkingWaterFAQ/
https://www.cdc.gov/drugresistance/

CEE RESEARCHERS: Building Stronger Infrastructure

ABC News file photo: Devastation left in wake of Typhoon Haiyan

Hurricanes. Typhoons. These are words which strike fear into the hearts of people who live in coastal regions and island nations. Storms like these mean loss of life, property damage, flooding, and loss of electricity. Long term electricity loss can severely impact a community's ability to rebound and rebuild. Civil and environmental engineering researchers can help alleviate these impacts.

Dr. Shen-en Chen, an engineering researcher at UNC Charlotte, has been researching ways to construct power delivery systems which are hurricane resilient. For the past two years, he and his research team have been studying Super Typhoon Haiyan from various angles.

Super Typhoon Haiyan, known as Hurricane Yolanda in the Philippines, made landfall on November 8, 2013 in Guiuan province as a Category 5. The storm is the deadliest typhoon in Philippines history and possibly the strongest tropical cyclone ever observed. The geographic reach and intensity of the storm is compared to that of Hurricane Katrina in the western hemisphere.

By studying the effects of Haiyan, researchers can help coastal municipalities around the world better plan and build infrastructure which will fail less often during super storms. The goal, said Dr. Chen, is to create power systems with "strong backbones and weak distribution systems." Power systems like these translates into less down time, fewer residents in the dark, and lower reconstruction costs. Many municipalities are finding the costs and time to restore power to be a crippling endeavor. By studying the worst storms, Dr. Chen and his team will be able to strengthen the power grid and design systems to be more resilient.

Dr. Chen's latest research has been submitted for publication in the *Sustainable Cities and Society Journal*, an international publication focusing on fundamental and applied research aimed at reducing the environmental and societal impact of cities. Collaboratively, he has developed a structural rating system for residential and commerical buildings, based on quantitative measurements taken after Hurricane Haiyan.

Dr. Chen and fellow researchers are developing ways to help engineers and builders in other parts of the world develop sustainable building codes and standards. The result will be better buildings and tougher power delivery systems. In other words: Stronger infrastructure wherever storms threaten. ◆

SOURCE: *The Weather Channel*

Research sponsorship information: NSF RAPID Project 1433262 and ASCE

RECENT RESEARCH Awards

Grant Name	Principal Investigator/Co-PI	Grantor	Amount
Technical Advisory Services for Southern Company Ash Basin Closure Projects	Milind Khire, Ph.D., P.E. Chris Hardin, P.E.	Southern Company	$100,000
Field-Scale Testing of Hydrology of Water Balance Covers	Milind Khire, Ph.D., P.E.	Waste Management, Inc.	$67,108
First Phase of Development of a Low-Cost, Portable, and Rapid Nondestructive Inspection Tool for Wood Distribution Poles	Matthew Whelan, Ph.D.	Duke Energy Corporation	$154,245
The Role of Environmental Buffers in Potable Water Reuse	Olya Keen, Ph.D.	NCSU Water Resources Research Institute	$109,123
Center for Advanced Multimodal Mobility Solutions and Education (CAMMSE)	Wei Fan, Ph.D., P.E. Dr. Martin Kane, Dr. Miguel Pando, Dr. David Weggel, and Dr. Yu Wang (Computer Science)	U.S. Department of Transportation	$7,800,000

This is a subset of CEE grants awarded in 2016

A DIVERSE Profession

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Jenet Hattaway, Ph.D. student

UNC Charlotte alumni. Her grandfather, Ken Hoffman, was an engineer with Mecklenburg County for his entire career.

Like Jenet, Bristol identifies more with the environmental focus of the program. She has interned twice with the City of Charlotte in its Water Department. Her trip to Haiti during the summer after the 7.0 magnitude earthquake that took place in 2010 exposed her to the great need worldwide for engineers who have expertise in water and wastewater treatment.

Bristol has enrolled in the CEE Early Entry Master's program while she finishes her BS in Civil Engineering. Her MS research is with Dr. Mariya Munir, a new CEE faculty member who has done notable work in the area of antibiotic resistance in wastewater. Bristol will complete the MS program in 2018. She's keeping her post-graduation options open now, she says, but can easily see herself designing wastewater treatment plants overseas.

While at UNC Charlotte, Bristol has enjoyed a wide range of extracurricular activities including involvement in the American Society of Civil Engineers (ASCE), the Society of Women Engineers (SWE) and the Charlotte International Fellowship. She came to UNC Charlotte in her parents' footsteps but stayed because of the community, diversity, and sense of purpose she found here.

The CEE department currently has 436 BS students enrolled. Seventy-two of these undergraduates are women. Seven of the 25 CEE faculty members are women. They face similar challenges as many women on STEM career paths. Their journeys are unique but often lead to dreams fulfilled. The experiences of Dr. Erika Weber, Jenet Hattaway, and Bristol Weekly are proof of that. ◆

Photo credit: Mike Hermann